

## ABSTRACT

An apparatus and method for extracting energy is provided. In one aspect the method includes using chemical reactions to generate vibrationally excited molecules, such as high-quantum-  
5 number-vibrationally-excited gas molecules in a region. The vibration energy in the vibrationally excited molecules is converted into hot electrons when the excited molecules contact a conductor. A geometry is provided so that the excited molecules may travel, diffuse or wander into a conductor before losing a useful fraction of the vibrational energy. Optionally,  
10 the generating and the converting process may be thermally separated, at least in part. The short lived hot electrons are converted into longer lived entities such as carriers and potentials in a semiconductor, where the energy is converted into a useful form.